

In re TURNER ET AL., Application No. 09/520,684
Amendment C

REMARKS

The Office action dated March 8, 2004, and the references cited have been fully considered. In response, please enter the amendments and consider the following remarks.

Applicants herein add four new claims 34-37 based on pending claims 25-26 and 29-30 while removing the limitation of "wherein said forwarding the particular data packet during the current cell time includes removing the particular data packet from an arrival buffer and if said removing causes the arrival buffer to become empty, in response adding a new floor indication to the arrival buffer" or means for such from new independent claims 34 and 36. No new matter is added herein. Also, support and allowance over the prior art of record are provided at least for the same reasons as for pending claims 25-26 and 29-30.

Applicants appreciate the Office reconsidering and entering Amendment B, and for generating a new non-final Office action.

However, Applicants respectfully traverse the rationale set forth therein in rejecting all pending claims based on Fan (US Patent 5,337,308) for at least the reasons presented hereinafter.

One general concept that may help clear things up is the use of the term cell time (by present application which is called "cell transfer time" by Fan. For simplicity, Applicants will refer to these as a "cell time". A cell time refers to the time to transfer a cell, for example, from a first stage to a second stage switching network. A switching stage then performs multiple switching operations at a higher rate (i.e., has a speed-up), typically that of the number of input ports - i.e., number of packets that can be received in a cell time. This occurs to prevent the switch from being overrun with packets as it must switch packets at their arrival rate. For example, Fan teaches it uses a second stage NxN packet switch with N input links (col. 5, lines 56-60) and it repeats its selection and switching of a packets N times within a cell transfer time (col. 6, lines 32-33). Fan sometimes refers to these as "slots" within a cell time as used in describing FIGs. 5A-B in col. 7, lines 1-36. Similarly, the present application show in FIG. 7 a

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cell time and a loop of processing cycles with a decision block of H determining whether another processing cycle can be performed in a cell time.

Independent claims 24 and 34 recite the limitation of "in response to identifying that not one of said data packets has associated therewith the earliest timestamp value, discontinuing forwarding of said one or more data packets during a current cell time;" and independent claims 29 and 36 recite "means for discontinuing forwarding of said one or more data packets during a current cell time in response to identifying that not one of said data packets has associated therewith the earliest timestamp value." Also, claim 25 depending from claim 24 and claim 35 depending from claim 34 recite "wherein time remains in the current cell time to forward at least one of said one or more data packets when said discontinuing forwarding of said one or more data packets during the current cell time is performed;" and claim 30 depending from claim 29 and claim 37 depending from claim 36 recite "wherein time remains in the current cell time to forward at least one of said one or more data packets when said discontinuing forwarding of said one or more data packets during the current cell time is performed."

In rejecting these limitations, the Office action states that Fan teaches "[i]f an RT cell is selected based on having an earliest time stamp value at a particular time, it is equivalent to discontinuing forwarding of a data packet during a current cell time, as in the present invention, because a data cell will not be sent unless it has the earliest time stamp value." However, Applicants do not believe this is a teaching of Fan.

In contrast to this statement, independent claims 24 and 34 recite "in response to *identifying that not one of said data packets has associated therewith the earliest timestamp value*, discontinuing forwarding of said one or more data packets during a current cell time" (*emphasis added*) and independent claims 29 and 36 recite means for such. Fan neither teaches nor suggests identifying that not one of said data packets has associated therewith the earliest timestamp value as it handles RT and data cells the same, so it neither teaches nor suggests *identifying that not one of said data packets has associated therewith the earliest timestamp value* as recited in the claims, let alone performing some action "in response" to such as recited

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by the claim, and further let alone, discontinuing forwarding of data packets for the rest of the duration of the cell time as recited in the claim.

Fan teaches that RT cells are received by the second switching stage 13 from the first switching stage 12 when an output buffer at the first stage is empty during/after the last slot of a current cell time, and thus, a generated RT cell is transmitted to second switching stage 13 during the next cell time. (See, col. 7, lines 21-25 where $N=4$). Also, Fan teaches that: "The time-stamped cells from the first stage 12 queue up in the input buffers 31. When each input buffer receives at least one cell, the time stamp value of this cell is compared with the time stamp values of all other cells. To this end, a minimum time-stamp (TS) value detector 34 is connected to all input buffers 31 to receive ATM cells that are stored in the foremost (earliest) locations of the input buffers 31 to examine their time stamp values and detects one or more cells having a minimum, or earliest time stamp value. The identifiers of the cells having the minimum time stamp values are supplied to a selector 35 where one of the cell identifiers is selected and a shift command is supplied to the buffer 31 where the selected cell is stored. In this way, the cell with the earliest time stamp value is read out of an input buffer 31 and launched into a self-routing switch 32. This process is repeated N times within a cell transfer time." Col. 6, lines 15-32. Note, based on the description of FIGs. 5A-B in col. 7, lines 1-36, which describes that cells with different time-stamp values can be sent in a same packet time, Applicants interpret "this process is repeated N times" to include determining a new minimum time stamp value for each slot of a packet time.

Thus, in contrast to the statement in the Office action, Applicants believe that Fan actually teaches that for each slot of a packet time: (1) a minimum time stamp will be determined and (2) a cell (no distinction made in the type of cell) with this time stamp value will be forwarded to the self-routing switch. With these steps being repeated as long as there are more slots left in the current cell time. Then, at the beginning of a next cell time, new packets have arrived and are available in buffers 31, and the sending of cell repeats for N slots during a next cell time.

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Note, if Fan operates as stated in the Office action, then when both an RT and one or more data cells have the same minimum time-stamp value and the RT cell is selected prior to any of such data cells (as Fan teaches just to select one cell without regard to its type) and forwarding of data cells is stopped for the remainder of the current cell time (as stated in the Office action), then the performance of the switch would be greatly reduced and possibly even get into a blocking condition where no data cells would be forwarded.

For at least these reasons, applicants believe Fan neither teaches nor suggests this claimed improvement, nor is this claimed improvement obvious in light of the teachings of Fan. Therefore, applicants respectfully request that the rejections of claims 24, 25, 29, and 30 be withdrawn, and applicants believe claims 24-25, 29-30, and 34-37 are allowable.

Next, independent claims 24 recites "wherein said forwarding the particular data packet during the current cell time includes removing the particular data packet from an arrival buffer and if said removing causes the arrival buffer to become empty, in response adding a new floor indication to the arrival buffer" and independent claims 28, 29 and 33 recite a similar limitation or means for such.

The prior discussion also helps to distinguish the teachings of Fan and that recited in these claims, especially in terms of the operations performed in relation to a cell time and in relation to slots within a cell time. For example, applicants respectfully traverse the statement in the Office action that "the output buffers of the first stage never become empty, since if no data cell is present to send, an RT cell is sent." Actually, an output buffer can be empty at anytime; rather if an output buffer is empty after the last slot of a cell time, then during the next cell time the corresponding output link is supplied with an RT cell from the RT cell generator. These packets then are placed in buffer 31, unless the cell is an RT cell and an RT cell is in the last position of the arrival buffer in which case it overwrites the previous RT cell. *Note, this happens once each cell time, and not each once each slot of a cell time.* Thus, if a buffer 31 becomes empty, it will not be filled from a previous stage cell until the next cell time.

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Moreover, this rejection in the Office action does not even address the recited limitation of "*if said removing causes the arrival buffer to become empty, in response adding a new floor indication to the arrival buffer.*" Fan operates the same whether a buffer becomes empty or not and doesn't provide a mechanism to check if this removing of a cell causes the arrival buffer to become empty, let alone performing some action *in response* to such determination, and further let alone, this performed action being adding a new floor indication to the arrival buffer.

For at least these reasons, applicants believe Fan neither teaches nor suggests nor is this claimed improvement obvious in light of the teaching of Fan. Therefore, applicants respectfully request that the rejections of claims 24-25, 28, 29-30, and 33 be withdrawn, and applicants believe claims 24-25, 28, 29-30, and 33 are allowable.

Final Remarks. In view of the above remarks and for at least the reasons presented herein, all pending claims are believed to be allowable over the prior art of record, the application is considered in good and proper form for allowance, and the Office is respectfully requested to issue a timely Notice of allowance in this case. If, in the opinion of the Office, a telephone conference would expedite the prosecution of the subject application, the Office is invited to call the undersigned attorney.



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The Commissioner is hereby generally authorized under 37 C.F.R. § 1.136(a)(3) to treat this communication or any future communication in this or any related application filed pursuant to 37 C.F.R. § 1.53 requiring an extension of time as incorporating a request therefore, and the Commissioner is hereby specifically authorized to charge Deposit Account No. 501430 for any fee that may be due in connection with such a request for an extension of time. Moreover, the Commissioner is hereby authorized to charge payment of any fee due any under 37 C.F.R. §§ 1.16 and § 1.17 associated with this communication or any future communication in this or any related application filed pursuant to 37 C.F.R. § 1.53 or credit any overpayment to Deposit Account No. 501430.

Respectfully submitted,
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By

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